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## ANNEX 5

# EMERGENCY RESPONSE PROCEDURES

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The purpose of this Annex is to provide additional information regarding emergency response procedures which are not described elsewhere in the Integrated Contingency Plan.

- 5.A Pre-Emergency Planning and Coordination**
- 5.B Refinery and Nitrogen Operating Procedures**
- 5.C Rescue Procedures**
- 5.D First Aid Procedures**
- 5.E Medical Surveillance Program for Emergency Response Team**
- 5.F Decontamination Guidelines & Procedures**

### **5.A. Pre-Emergency Planning and Coordination**

A Coffeyville Resources representative has historically participated in LEPC activities, and Coffeyville Resources provides emergency response plan information and updates to the LEPC. Facility representatives have made arrangements to familiarize local police, fire and emergency response personnel with the layout of the facility and general plant hazards, and have hosted periodic Facility tours for these external response personnel. Coffeyville Resources has provided the LEPC and Coffeyville Fire Department MSDS information in accordance with the reporting requirements of 40 CFR Part 370 (Hazardous Chemical Reporting: Community Right-to-know). Representatives of the Coffeyville Regional Medical Center Emergency Room and Coffeyville Emergency Medical Service have also been provided this information. These arrangements have been made to familiarize local response personnel with the potential hazards of refining and fertilizer operations.

Pre-Emergency Planning is conducted with the mutual aid fire departments on an annual basis. Coffeyville Resources Fire Department host training sessions in which all the mutual aid and surrounding responders are invited to attend, these sessions involve a tabletop and a hands on exercise. Different scenarios are used for each training session and have included a simulated Crude Oil Tank Fire, an HF Acid Release, and A Unit Fire with an elevated rescue, a BLEVE and an Ammonia release. The LEPC members and the Montgomery County Emergency Manager also attend. NIMS are established and observers are assigned to critique the response and the operation.

Coffeyville Resources Fire Department also attends training sessions with the Coffeyville Fire Department, South Coffeyville Fire Department, Caney Fire Department and Cherryvale Fire Department. Coffeyville Resources Fire Department also will respond to mutual aid request to assist the communities.

## **5.B. Refinery Operating Procedures**

Operation of Refinery and Fertilizer process units requires operating within various limitations (e.g. temperature, pressure, flow rates, etc.) associated with the process equipment (materials, construction) and process materials (feeds and products). These limitations are for safety purposes as well as for maintenance of product specifications. There are additional operating limitations related to environmental requirements, as well. The Refinery and Fertilizer process units are continuous, not batch, operations. Accordingly, although operations and operation-related upsets can initiate emergencies or can contribute to an emergency initiated by an external source, operating procedures play a critical role in emergency response and termination. For example, “stop the flow” and “secure the source” usually involve operating procedures, and could be involved to divert product flow from a fire, or to reduce or terminate a hazardous substance release.

Refinery and Fertilizer operating procedures, which are a significant part of normal operator training, include procedures categorized as emergency procedures, shutdown procedures, and Standard Operating Conditions and Limits (SOCLs). Each process area has a Job Document Coordinator or Unit Coordinator, an experienced operator who has participated in developing these procedures. SOCL procedures incorporate operating limits based on safety, product specifications, and maintenance of process unit control; these procedures include consequences of deviation from the operating limits and steps to take to avoid or correct the deviations. If an emergency develops which involves or is impacted by a Refinery or Fertilizer process unit, any of these types of procedures would be used as part of, or to provide, mitigation. The general purpose/goal of the operating procedures is to maintain or achieve stable conditions with respect to temperatures, pressures, and flows. Circulation of process material flows within a process unit or system can be used to maintain or achieve stability; if shutdown is necessary, shutdown can then be conducted in a controlled manner.

In evacuation situations, depending on the scenario, a process unit would evacuate non-essential personnel and a skeleton crew of operators would remain to stabilize a unit, or to shut it down prior to evacuating (if evacuation is still necessary). Plant operations or management has the final authority for decisions involving these kinds of actions.

In the event that conditions require personnel who have stayed to stabilize or shutdown a unit to take safe haven in a control room, if necessary they shall shut down forced ventilation systems and seal doors and other openings. These personnel may also need respiratory protection or other PPE. Radio and or phone communications shall be maintained with the Incident Command. As soon as conditions are safe, the evacuation can be completed.

## **5.C. Rescue Procedures**

Immediate rescue efforts may be necessary in certain situations, prior to arrival of emergency response personnel. While some types of rescue require specialized training (e.g., confined space rescue), some general guidelines are provided to Refinery personnel, and can be used by personnel who have had applicable PPE training (respirators, chemical protective PPE). In all emergencies involving rescue, Refinery emergency notifications (Shift Supervisor, paging system for Emergency Response Rescue Team, Emergency Medical Team) are to be implemented as described in the emergency response plan (**Section 2.2.1, 2.3.1**).

### **Procedure for Rescue of Immobile Victims**

The following procedure is designed to be used in all areas of the Refinery where injuries or illnesses might require rescue efforts.

1. First-aid certified employees will render first aid as required and trained.
2. Do not move the victim unless there is a threat from fire, chemical exposure, or other life threatening hazard. The expertise and equipment of the Coffeyville EMS will be used whenever possible, along with the Refinery personnel who are certified EMTs or First Aid Responders. If a fire or chemical hazard threatens, follow the procedures outlined in Specific Hazards.

### **Rescue Procedures for Fire Emergencies**

1. Fire rescue will be attempted only when there is evidence that a life can be saved.
2. Two people will don SCBA and Fire Bunker Gear. One person will carry a case with a SCBA and a case with a Fire Bunker Gear into the area where the victim is located. The other person will act as a backup.
3. All necessary capacity for foam and/or water application will be used for protective cover for personnel in a rescue attempt.

### **Rescue Procedures for Chemical Emergencies**

Chemical emergencies may or may not require additional procedures required for toxic chemical and hydrocarbon vapor releases. Should the situation require the use of more than one procedure, personnel will have to coordinate the procedures to fit the situation.

### **H<sub>2</sub>S Rescue**

Top Operator, if available, is in charge and will work with the OSIC. Should you experience an H<sub>2</sub>S leak that renders personnel unconscious, do the following:

1. Notify the Shift Supervisor who will call for ambulance and for extra help from other units as needed. When help arrives, you must instruct them on what needs to be done.
2. Immediately have two trained unit personnel don SCBAs to initiate the rescue and an additional two personnel wearing the same PPE, for back-up. Always use your own people as they will be more familiar with your area. The Top Operator will

not don an SCBA but will remain in charge of the rescue operation at the unit site. Any attempt at rescue without proper PPE is not allowed.

3. After the rescue, use first-aid certified personnel who have been sent to help perform appropriate First Aid treatment on the victim. The ambulance and EMT's will be escorted to you. If possible, transport the victim to an area where the ambulance personnel can receive the victim without danger to themselves.
4. At your discretion you may attempt to have your (suited) rescue people stop the leak; but remember they will need to be decontaminated before being removed from the suits before they run out of breathing air.

#### HF Acid Rescue (can also use for Sulfuric Acid or Caustic)

Top Operator, if available, is in charge and will work with the OSIC. Should you experience an HF acid leak that renders personnel unconscious, do the following:

1. Notify the Shift Supervisor who will call for ambulance and for extra help from other units as needed. When help arrives, instruct them on what needs to be done.
2. Immediately suit up in Level A PPE (described in Annex 4) two Alky and/or Cat employees to perform the rescue and an additional two personnel properly dress in PPE for back-up. Always use your own people as they will be more familiar with your area. The Top Operator will not suit up. He must remain in charge of the rescue at the unit site. Any rescue without proper PPE is not allowed.
3. Use water fog if necessary. If water is not immediately available, make sure a fire truck has been called to the scene for water use by the rescue team.
4. After the rescue, have employees decontaminate the victim. Check for breathing and pulse. Do not use direct mouth-to-mouth contact for resuscitation. CPR may need to be done by certified people. Treatment of burns can be started immediately. The ambulance will be escorted to the scene. If possible, transport the victim to an area where ambulance personnel can receive the victim without danger to themselves.
5. At your discretion, you may try to have your (suited) rescue people stop the leak; but remember they need to be decontaminated and removed from their suits before running out of breathing air.

#### Hydrocarbon Liquid Rescue

Top operator, if available, is in charge and will work with the OSIC. Should you experience a situation that requires rescue of people who have been exposed to liquid hydrocarbons, who may or may not be unconscious, perform the following:

1. Notify the Shift Supervisor who will call for ambulance and for extra help from other units if needed. You should be aware of the fire danger of hydrocarbons. Foam application should be applied to flammable liquids.
2. Consider factors such as temperature and depth of the liquid to select appropriate PPE, such as slicker suits, rubber gloves, and rubber boots, and appropriate respiratory protection. The Top Operator will not allow any attempt at rescue without the proper PPE. Placement of boards/planks to walk on may be useful.

3. Perform rescue and have the employees decontaminate the victim. Check for breathing and pulse. Do not use direct mouth-to-mouth contact for resuscitation. CPR may need to be done by certified people. Treatment of burns should also be started immediately. The ambulance will be escorted to the scene. If possible, transport the victim to an area where ambulance personnel can receive the victim without danger to themselves.
4. Stop the leaking hydrocarbon if possible.
5. When you send someone to the gate to escort the ambulance, make sure this person is given instructions to guide the ambulance upwind of the scene.

#### Hydrocarbon Vapor Rescue

Top Operator, if available, is in charge and will work with the OSIC. Should you experience a situation that requires rescue of unconscious employees exposed to hydrocarbon vapors, do the following:

1. Notify the Shift Supervisor who will request ambulance, and help from other units as needed. When help arrives, instruct team on what needs to be done.
2. If available, place water monitors in service to suppress the vapors and to protect victims and rescue workers. Be aware of the potential fire danger. Have two people don SCBA and Fire Bunker Gear. You should always use your own people as they will be more familiar with the area. The Top Operator will not suit up. He must remain in charge of rescue procedures at the scene. He will not allow any attempt at rescue without the proper PPE.
3. Have the employees help decontaminate the victim. Check for breathing and pulse. Do not use direct mouth-to-mouth contact for resuscitation. CPR may need to be performed by certified people. Treatment of burns can be started immediately. An ambulance will be escorted to the area. The person escorting the ambulance should be instructed to direct the ambulance to an area upwind of the release. If possible, bring the victim to an area where ambulance personnel can receive the victim without danger to themselves.
4. By using discretion, your rescue team may try and stop the vapor leak.

#### NH<sub>3</sub> Vapor Release – Ammonia Release

Top Operator, if available, is in charge and will work with the OSIC. Should you experience an NH<sub>3</sub> leak that renders personnel unconscious, do the following:

1. Notify the Shift Supervisor who will call for ambulance and for extra help from other units as needed. When help arrives, you must instruct them on what needs to be done.
2. Immediately have two trained unit personnel don SCBAs to initiate the rescue and an additional two personnel wearing the same PPE, for back-up. Always use your own people as they will be more familiar with your area. The Top Operator will not don an SCBA but will remain in charge of the rescue operation at the unit site. Any attempt at rescue without proper PPE is not allowed.

3. After the rescue, use first-aid certified personnel who have been sent to help perform appropriate First Aid treatment on the victim. The ambulance and EMT's will be escorted to you. If possible, transport the victim to an area where the ambulance personnel can receive the victim without danger to themselves.
4. At your discretion you may attempt to have your (suited) rescue people stop the leak; but remember they will need to be decontaminated before being removed from the suits before they run out of breathing air.
5. First Aid Procedures:
  - Eye Contact: Immediately flush eyes with water for 15 minutes keeping eyelids open, contact EMS.
  - Skin Contact: Flush exposed areas thoroughly with water. If clothing is frozen to skin, thaw out area first with water before removing clothing. Contaminated clothing can cause secondary burns to responders. Watch for signs of hypothermia on patient. Call EMS.
  - Inhalation: Irritates nose, mouth, throat and lungs. The airway may swell and make breathing difficult. Move patient to fresh air, perform artificial respiration if not breathing and administer oxygen. Call EMS.
  - Ingestion: Give water or milk if patient can swallow. Call EMS. Do not make person vomit, or attempt to neutralize.

#### **5.D. First Aid Procedures**

The Refinery has a licensed health care professional (HCP) on staff who works under the direction of the company medical doctor. The HCP maintains a first aid station, supplies and equipment. The HCP or CPR/First Aid certified personnel will administer emergency and first aid care per established procedures. The first aid procedures are kept available in the first aid station. The emergency care and first aid procedure is as follows.

#### **EMERGENCY CARE AND FIRST AID**

**The following procedures should be activated immediately for all emergency situations:**

**Assess airway, breathing, and circulation.**

**Control bleeding.**

**Prevent and treat for shock.**

**Prevent infection and further injury.**

**Arrange for transportation to Coffeyville Regional Medical Center Municipal Hospital via ambulance or transport to Coffeyville Family Practice Medical Clinic as required by the situation.**

**Provide the physician with as much history and information as possible about the injury or illness, such as: vital signs, emergency care rendered, medications taken (if known), and events which immediately preceded the injury/illness. Give accident investigation information if available, and send along a copy of the Emergency Information Sheet located in large notebooks on a bookshelf in the Nurses' Office. Record all pertinent data and provide for follow-up.**

**Upon dialing 911, the EMT/Ambulance personnel will be on the scene within four to ten minutes from the time of the call.**

#### **EMERGENCY PHONE NUMBERS**

**Coffeyville Family Practice Medical Clinic - (620) 251-1100**

**Coffeyville Regional Medical Center/Hospital - (620) 251-1200**

**Poison Control Center - (800) 955-9119**

**Fire, Police, and Sheriff- 911 (or other local numbers)**

Other first aid procedures kept available for use include the following:

Abdominal Injuries  
Amputation  
Anaphylactic Shock  
Asthmatic Reaction  
Back Injuries, Back Complaints  
Bite Wounds (Animal, Insect)  
Blisters  
Burns (Thermal, Chemical, Electrical, Ultraviolet)  
Cardiac Emergencies  
Chest Wall Injuries  
Contusions  
Convulsive Disorder  
Critical Illness or Death  
Cumulative Trauma Disorders  
Dermatitis

Diabetic Emergencies  
Drug Abuse  
Ear Infection-Injury  
Electric Shock  
Eye Emergencies  
Fainting  
Fractures and Dislocations  
Gastrointestinal Complaints  
Headache  
Head Injury  
Hernias  
Lacerations-Punctures-Tetanus  
Nosebleed  
Respiratory  
Shock  
Splinters and Slivers  
Sprains and Strains  
Stress  
Thermal Injuries  
Supply List (Over the Counter medications and Supplies)

#### **5.E. Medical Surveillance Program for Emergency Response Team**

Coffeyville Resources has instituted a medical surveillance program for the Facility's Emergency Response Team members in accordance with 29 CFR 1910.120(f), as referenced by 1910.120(q)(9). This includes a baseline physical and medical surveillance. If response personnel exhibit signs or symptoms which may have resulted from hazardous substance exposure during an emergency incident, medical consultation will be provided in accordance with 29 CFR 1910.120(f)(ii). The baseline physical occurs prior to assignment, and medical examinations are conducted at least once a year thereafter, and upon termination or reassignment. Examinations will also be conducted upon notification of possible overexposure to hazardous substances (including above the PEL or published exposure levels) or health hazards in an emergency situation.

Medical examinations include medical and work history with emphasis on symptoms related to hazardous substance handling, and fitness for duty including ability to wear PPE under expected site conditions. Examinations are provided to the employee at reasonable times without cost or loss of pay. Information required by 29 CFR 1910.120(f)(6) is provided as part of the examination process. Response personnel are provided with the examining physician's report in accordance with 29 CFR 1910.120(f)(7). The Refinery retains records in accordance with 29 CFR 1910.120(f)(8).

## **5.F. Decontamination Guidelines & Procedures**

Employees and/or equipment may become contaminated during emergency response to a fire or hazardous material release. Work practices that minimize contact with waste (and thus the potential for contamination) and decontamination guidelines and procedures that protect the employees and the environment have been developed.

### **I. INTRODUCTION**

The first step in decontamination is to follow standard operating procedures that minimize contact with waste and thus the potential for contamination. The following work practices have been developed to minimize employee and equipment contamination:

- Disposable outer garments and equipment will be used when possible and appropriate
- Prior to each use, the personal protective equipment will be checked to ensure that it contains no cuts or punctures that could expose workers to contaminants
- Employees will don appropriate protective gear before entering an exclusion zone (hot zone) to minimize the potential for contaminants to bypass the protective clothing
- Monitoring and sampling instruments will be bagged or otherwise protected from contamination
- Employees are cautioned not to walk through areas of obvious contamination or touch potentially hazardous substances
- Remote sampling, handling and container-opening techniques (e.g., drum grapplers, pneumatic impact wrenches) will be used when appropriate
- Sources of contaminants will be encased (e.g., plastic sheeting and overpacks) when possible

Even with good work practices such as described above, personnel and/or equipment contamination may result from **primary** exposure (direct contact with the hazardous material) or **secondary** exposure (contact with a contaminated person, equipment or by-products such as runoff water). Personnel working in contaminated sites generally become contaminated in one or several of the following ways:

- Contacting vapors, gases, mists or particulates in the air
- Being splashed by materials while working
- Walking through puddles of liquids or on contaminated soil
- Using contaminated instruments or equipment.

Decontamination is the process of removing or neutralizing contaminants that have accumulated on personnel and/or equipment. The procedures used are critical to the health and safety of employees responding to the release of a hazardous waste or other hazardous material because employee contamination by hazardous substances can cause acute and chronic health effects.

Decontamination protects workers from hazardous substances that may contaminate and eventually permeate the protective clothing, respiratory equipment, tools, vehicles, and other equipment used in response activities. It protects all facility personnel by minimizing the transfer of harmful materials into clean areas. It helps prevent mixing of incompatible chemicals. It protects the community by preventing uncontrolled transportation of contaminants from the facility.

The basic four methods of decontamination are as follows.

**Dilution** is the common method of flushing the chemical or substance with water. It is quick and usually economical method, but it can create considerable volumes of waste water.

**Absorption or adsorption** works well only on flat surfaces, but also creates large volumes of waste.

**Chemical degradation** involves changing the hazardous substance to a non-hazardous material. Generally it cannot be used on personnel because of heat generated by the chemical change.

**Isolation and disposal** includes packaging and transporting the hazardous material off-site, and is generally not available to first responders as a method of decontamination.

## II. PRELIMINARY CONSIDERATIONS

### A. Initial Planning

A system is set up for personnel decontamination to wash and rinse, at least once, all the protective equipment worn. This is done in combination with a sequential doffing of protective equipment, starting at the first station with the most heavily contaminated item and progressing to the last station with the least contaminated article. Each procedure requires a separate station.

The spread of contaminants during the washing/doffing process is further reduced by separating each decontamination station by a minimum of 3 feet. Ideally, contamination should decrease as a person moves from one station to another further along in the line.

Specific conditions at the site are evaluated, including:

- Type of contaminant
- The amount of contamination
- Levels of protection required
- Type of protective clothing worn
- Type of equipment needed to accomplish the work task

A decontamination plan is adapted to site conditions. For instance, a general, preliminary plan might require a complete wash and rinse of chemical protective garments. If disposable garments are worn, the wash/rinse step could be omitted. Wearing disposable boot covers and gloves could eliminate washing and rinsing these items and reduce the number of stations needed.

## B. Contamination Reduction Corridor

An area within the Contamination Reduction Zone (warm zone) should be designated the Contamination Reduction Corridor (CRC). The CRC controls access into and out of the Exclusion Zone (hot zone) and confines decontamination activities to a limited area. The size of the corridor depends on the number of stations in the decontamination procedure, overall dimensions of work control zones, and amount of space available at the site. Whenever possible, it should be a straight path.

The CRC boundaries should be conspicuously marked, with entry and exit restricted. The far end is the hotline, the boundary between the Exclusion Zone or hot zone and the Contamination Reduction Zone (warm zone). Personnel exiting the Exclusion Zone must go through the CRC. Anyone in the CRC should be wearing the Level of Protection designated for the decontamination crew. Another corridor may be required for heavy equipment needing decontamination.

Within the CRC, distinct areas should be set aside for decontamination of personnel, portable field equipment, removed clothing, etc. These areas should be marked and personnel restricted to those wearing the appropriate Level of Protection. All activities within the corridor should be confined to decontamination.

Personnel protective clothing, respirators, monitoring equipment, and sampling supplies should be maintained outside the CRC. Personnel should don their protective equipment away from the CRC and enter the Exclusion Zone through a separate access control point at the hotline.

## III. EXTENT OF DECONTAMINATION REQUIRED

### A. Decontamination Plan Modifications

A decontamination plan must be adapted to specific conditions found at the incident. The conditions may require more or less personnel decontamination than planned, depending on the following factors:

1. **Type of Contaminant:** The extent of personnel decontamination depends on the effects the contaminants have on the body since contaminants do not exhibit the same degree of toxicity (or other hazard). Whenever it is known or suspected that personnel can become contaminated with highly toxic skin-destructive substances (acids or caustics), a full decontamination procedure should be followed. If less hazardous materials are involved, the procedure can be downgraded.
2. **Amount of Contamination:** The amount of contamination on protective clothing (and other objects or equipment) is usually determined visually. If, on visual examination, it appears grossly contaminated, a thorough decontamination is generally required. Gross material remaining on the protective clothing for any extended period of time may degrade or permeate it. This likelihood increases with higher air concentrations and

greater amounts of liquid contamination. Gross contamination also increases the probability of personnel contact.

3. Level of Protection: The Level of Protection and specific pieces of clothing worn determine on a preliminary basis the layout of the decontamination line. Each Level of Protection incorporates different problems in decontamination and doffing of the equipment. For example: decontamination of the harness straps and backpack assembly of the self-contained breathing apparatus is difficult. A butyl rubber apron worn over the harness makes decontamination easier. Clothing variations and different Levels of Protection may require adding or deleting stations in the initial decontamination plan.

4. Work Function: The work each person does determines the potential for contact with hazardous materials. In turn, this dictates the layout of the decontamination line. For example, observers, photographers, operators of air samplers, or others in the Exclusion Zone performing tasks that will not bring them in contact with contaminants may not need to have their garments washed and rinsed. Others in the Exclusion Zone with a potential for direct contact with the hazardous material will require decontamination that is more thorough. Different decontamination stations could be set up for different levels of contamination. Additionally, personnel with a lesser degree of contamination could skip certain decontamination stations.

5. Location of Contamination: Contamination on the upper areas of protective clothing poses a greater risk to the worker because volatile compounds may generate a hazardous breathing concentration both for the worker and for the decontamination personnel. There is also an increased probability of contact with skin when doffing the upper part of clothing.

6. Reason for Leaving Site: The reason for leaving the Exclusion Zone also determines the need and extent of decontamination. A worker leaving the Exclusion Zone to pick up or drop off tools or instruments and immediately returning may not require decontamination. A worker leaving to get a new air cylinder or to change a respirator or cartridge, however, may require some degree of decontamination. Individuals departing the CRC for a break, lunch, or at the end of the day, must be thoroughly decontaminated.

#### B. Effectiveness of Decontamination

1. Field-available equipment may not immediately determine how effective decontamination is. Discolorations, stains, corrosive effects, and substances adhering to objects may indicate contaminants have not been removed. However, observable effects only indicate surface contamination and not permeation (absorption) into clothing, tools or equipment. In addition, many contaminants are not easily observed.

2. In many cases, depending on the substances involved, chemical protective clothing (or naturally absorbable materials) may have to be discarded. If it cannot be determined that clothing or other items, for example tools and equipment, have been completely

decontaminated, the only safe action is to consider them hazardous and have them disposed of properly.

#### C. Decontamination Equipment

Decontamination equipment, materials, and supplies are generally selected based on availability. Other considerations are ease of equipment decontamination or disposability. Most equipment and supplies can be easily procured. For example, soft-bristle scrub brushes or long-handle brushes can be used to remove contaminants. Water in buckets or garden sprayers can be used for rinsing. Large galvanized wash tubs, children's wading pools or stock tanks can be used to hold wash and rinse solutions. Large plastic garbage cans or other similar containers lined with plastic bags can be used to store contaminated clothing and equipment.

#### D. Decontamination Solutions

Personnel protective equipment, sampling tools, and other equipment are usually decontaminated by scrubbing with detergent-water using a soft-bristle brush followed by rinsing with copious amounts of water. While this process may not be fully effective in removing some contaminants (or in a few cases, contaminants may react with water), it is a relatively safe option compared with using a chemical decontaminating solution, which requires that the contaminant be identified.

#### E. Establishment of Procedures

Once a site-specific decontamination plan has been established, all personnel requiring decontamination must be given precise instructions. Compliance must be frequently checked. The time it takes for decontamination must be ascertained so that personnel wearing SCBA leave their work area with sufficient air to walk to the CRC and go through decontamination.

### IV. DECONTAMINATION DURING MEDICAL EMERGENCIES

If life-threatening injuries are received, prompt life-saving first aid and medical treatment may be required, without decontamination, or concurrently with it. Whenever possible, response personnel should accompany contaminated victims to the medical facility to advise on matters involving decontamination.

#### A. Physical Injury

Physical injuries can range from a sprained ankle to a compound fracture, from a minor cut to massive bleeding. Depending on the seriousness of the injury, first aid treatment may be necessary at the site.

Life-saving care should be instituted immediately without considering decontamination, but the rescuer's health should be considered at all times. The outer garments may be

removed (depending on the weather) if they do not cause delays, interfere with treatment, or aggravate the problem. Respirators and backpack assemblies must always be removed. Fully encapsulating suits or chemical-resistant clothing can be cut away. For minor medical problems or injuries, the normal decontamination procedure should be followed.

#### B. Heat Stroke

Heat stroke requires prompt treatment to prevent irreversible damage or death. Protective clothing may have to be cut off. Less serious forms of heat stress require prompt attention or they may lead to a heat stroke. Unless the victim is obviously contaminated, treatment must begin immediately.

#### C. Chemical

When protective clothing is grossly contaminated, contaminants may be transferred to treatment personnel or to the wearer and cause additional injuries. Unless severe medical problems have occurred simultaneously with the chemical exposure, the protective clothing should be washed off as rapidly as possible and carefully removed before treating the victim for the chemical exposure.

### V. PROTECTION FOR DECONTAMINATION WORKERS

The Level of Protection worn by decontamination workers is determined by:

- Expected or visible contamination on workers
- Type of contaminant and associated respiratory and skin hazards
- Total vapor/gas concentrations in the contamination reduction corridor
- Particulates and specific inorganic or organic vapors in the CRC
- Results of field and/or laboratory tests

A face shield is recommended to protect against splashes because respirators alone may not provide this protection. The respirator should have a cartridge approved for filtering any specific known contaminants such as ammonia, organic vapors, acid gases, and particulates.

### VI. DECONTAMINATION OF EQUIPMENT

Insofar as possible, measures should be taken to prevent contamination of sampling and monitoring equipment. Sampling devices become contaminated, but monitoring instruments, unless they are splashed, usually do not. Once contaminated, instruments are difficult to clean without damaging them. Any delicate instrument, which cannot be easily decontaminated, should be protected while it is being used. It should be placed in a clear plastic bag, and the bag taped and secured around the instrument. Openings should be made in the bag for sample intake and exhaust.

## A. Decontamination Procedures

1. Sampling devices: Sampling devices require special cleaning. Technical people or the operation/maintenance manual can provide information on proper decontamination methods.
2. Tools: Wooden tools are often difficult to decontaminate because they may absorb chemicals. They may need to be kept on site and handled only by protected workers. At the end of the response, wooden tools that cannot be decontaminated should be discarded. Other tools may be decontaminated by washing with a suitable solvent or chemical such as washing HF contaminated tools in a soda ash solution.
3. Respirators: Certain parts of contaminated respirators, such as the harness assembly and straps, are difficult to decontaminate. If grossly contaminated, they may have to be discarded. Rubber components can be soaked in soap and water and scrubbed with a brush. Regulators must be maintained according to manufacturer's recommendations. Persons responsible for decontaminating respirators should be thoroughly trained in respirator maintenance.
4. Heavy Equipment: Bulldozer, trucks, back-hoe and other heavy equipment are difficult to decontaminate. The method generally used is to wash them with water under high pressure or to scrub accessible parts with detergent/water solution under pressure. Particular care must be given to those components in direct contact with contaminants such as tires and scoops. Swipe tests could be utilized to measure effectiveness. Personnel doing the decontamination must be adequately protected for the methods used can generate contaminated mists and aerosols.

## B. Sanitizing of Personnel Protective Equipment

Respirators, reusable protective clothing, and other personal articles not only must be decontaminated before being reused, but also sanitized. The inside of masks and clothing becomes soiled due to exhalation, body oils, and perspiration. The manufacturer's instructions should be used to sanitize the respirator mask. If practical, protective clothing should be machine washed after a thorough decontamination. (Washing machines are located with PPE garment storage at the alky control room location.)

## C. Persistent Contamination

In some instances, clothing and equipment will become contaminated with substances that cannot be removed by normal decontamination procedures. A solvent may be used to remove such contamination from equipment if it does not destroy or degrade the protective material. If persistent contamination is expected, disposable garments should be used.

#### D. Disposal of Contaminated Materials

All materials and equipment used for decontamination must be decontaminated or disposed of properly. Wash water (or other solvent) used for decontamination of Refinery-associated materials can generally be disposed into the Refinery sewer system for subsequent wastewater treatment at the Refinery's treatment plant. Clothing, tools, buckets, brushes, and all other equipment that is contaminated with a highly toxic substance must be secured in drums or other containers for off-site disposal. Clothing not completely decontaminated on-site should be secured in plastic bags before being removed from the site.

**Note:**  $\text{NH}_3$  cannot be sent to wastewater. It must be contained in the Unit Sumps.